

HYDATID CYSTS OF THE KIDNEY.¹

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THE case I report furnished no previous history suggesting hydatids of the kidney. This condition was accidentally found during an operation for appendectomy. In the light of the operative findings and from a study of the specimen, I think the case furnishes some interesting features bearing on this rare disease.

G. D., Italian, aged thirty-two years, entered Harlem Hospital, December 26, 1901. He could speak no English. Examination showed a double inguinal hernia of the oblique, reducible variety. The right hernia reached the scrotum, the left only through the external inguinal ring. Temperature, 99.8° F.; pulse, 48; respiration, 22. He desired operation for the ruptures.

The following day, December 27, his temperature, which was normal in the morning, rose at 5 P.M. to 102.4° F.; pulse, 80; respiration, 28. No record of a chill. By gestures he indicated that there was pain in the abdomen.

Urinary Examination.—Color, pale straw. Reaction, acid. Sediment, moderate. Specific gravity, 1020. Albumen, absent.

On examination, tenderness was most marked over the right iliac fossa with some rigidity of the overlying abdominal muscles. An ice-bag was applied to the region and calomel in divided doses given. At 9 P.M., same day, temperature, 99.4° F.; pulse, 84; respiration, 26. On the 28th, the morning temperature was 102° F.; pulse, 84; respiration, 28. Epsom salts had been given early in the morning, followed by several movements

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of the bowels. An examination of his lungs showed dulness, prolonged high-pitched respiration, a few râles, and absence of tactile fremitus at the base of the right lung behind.

His abdominal symptoms were a little more severe, muscular rigidity spreading to include the right rectus and a greater tenderness over the appendix.

Diagnosis.—Pneumonia of the lower lobe of the right lung and acute appendicitis.

During the 29th the temperature remained the same, the pulse rose to 90 and 94, and respiration 28 to 30. On the 30th the temperature was 103° F.; pulse, 102; respiration, 22. The signs of an acute appendicitis were all present. A point of maximum tenderness in the right iliac fossa, general tenderness all over the abdomen, muscular rigidity increased so that the right abdominal muscles were all firmly contracted, and the patient used about the only two words he knew to tell us he had "much pain" in the abdomen.

The evidences of acute appendicitis rapidly increasing in severity decided me to operate in the presence of a pneumonia, for I believed that his chances were better without the appendix than with it. Accordingly, he was prepared for operation, and this was carried out about noon of the 30th.

The conditions about the cæcum are worthy of notice. Adhesions of long standing covered the cæcum and ascending colon, and united them firmly with the abdominal wall, the small intestines, and omentum.

After considerable difficulty the appendix was found lying posterior to the cæcum and extending upward and was removed. While liberating the appendix, a hard mass was felt in the upper part of the field. The wound in the abdominal wall was enlarged upward. The object lay deeply in the loin beneath intestines welded together by old adhesions. It was exposed, and on account of its hardness and position I imagined it to be a kidney containing a very large calculus. In freeing the kidney a soft spot on its anterior surface was torn through, and some fluid and several small whitish spherical bodies floated upward and escaped through the wound. The atrophic remains of the vessels and ureter were tied off, although I think now that there would have been little need for the ligature, as, on examining the specimen, no previous vessels or ureter can be seen. The wound was

flushed and closed over wick and tube drainage on account of the probable infection through the escape of the cysts and fluid.

On December 31, a day after the operation, the urine was as follows: Color, reddish, turbid. Reaction, acid. Specific gravity, 1022. Albumen, a trace.

The patient's record for the ensuing days was as follows:

	Temperature.	Pulse.	Respiration.
December 31, A.M.....	99.8°	92	22
December 31, P.M.....	100.4	96	20
January 1, A.M.....	100.4	96	20
January 2, A.M.....	101.8	104	24
January 2, P.M.....	102	112	20
January 3, A.M.....	103.8	124	36
January 3, P.M.....	104	120	30
January 4, A.M.....	100.8	104	26
January 4, P.M.....	102.4	112	28
January 5, A.M., about the same.			
January 6, highest.....	102.8	112	40

The wound healed readily to the drain. This brought away bloody serum in considerable quantity. The local signs of pneumonia increased in severity. The sputum was characteristic.

He died January 7, thirteen days after entering the hospital and eight days after the operation. No autopsy was obtained, although urgently solicited.

During the operation the liver was palpated. It was not enlarged nor nodular, but seemed unusually hard.

Dr. James Ewing has kindly examined the specimen, and furnished the following report:

"The cyst measures six by four by four and one-half centimetres. Its shape is distinctly that of a contracted kidney, one-half of which is slightly larger than the other. The wall varies from one to two centimetres in thickness, and is fibrous without, lamellated towards the centre, and covered within by a finely granular parenchymatous layer. In places the lamellated portion is calcific. The cavity is composed of one large and two smaller communicating loculi, which contain a score of translucent parasitic cysts of various sizes. In the parasitic cysts there are hooklets and cholesterol crystals but no scolices, while the walls are of the usual lamellated character.

"On microscopical examination no traces of renal tissue

could be identified, the outer wall being composed of dense fibrillar connective tissue infiltrated with lymphocytes."

The photograph was taken by Dr. Bertram Buxton.

In view of the rarity of the disease, I am sorry that a post-mortem was not permitted.

As the patient was unable to speak English and no interpreter was present at the time, there is no record of the patient's previous history. However, after examination of the specimen and from a statement that he was never sick, I am disposed to think that there had been very few, if any, symptoms produced by the cyst.

The usual course of echinococcus disease of the kidney is illustrated by the following case, reported by Marsh in 1869 (Lyon's Series), which I have abstracted from the original.

Marsh, 1869. Male, aged fifty-three years. Had not felt well for several days when, on April 1, 1866, he lifted a box of fruit and felt a sharp pain in the left lumbar region, which passed off in a few hours. During the following day or two he passed bloody urine. There was more or less pain in the region of the left kidney from this time on, and he passed a little blood in the urine once or twice, but there was no special urinary trouble.

General health declined. During the first year a tumor was perceived in the left lumbar region which increased downward and forward.

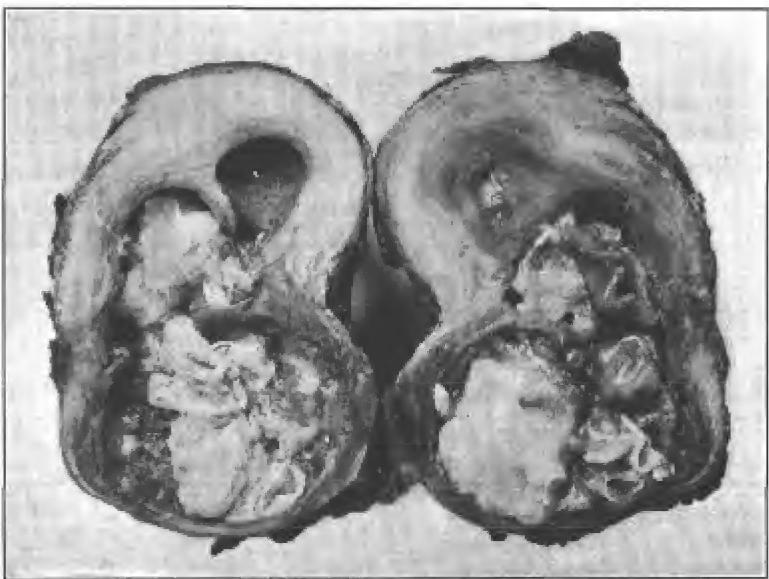
Occasionally lacerating pains radiated from the spine, through the tumor, and down to the left testicle, which at one time was swollen and tender. No sexual appetite.

He was up and about until March, 1869. Diarrhoea came on and lasted several months. Thirst was urgent, but drinking increased the diarrhoea. No oedema of the extremities; no cough; no dyspnoea. Usually slept well. Patient emaciated and anaemic at time of examination.

The tumor occupied the whole of the left side of the abdominal cavity and extended two inches to the right of the median line. Ribs and abdomen protrude on the left side. Tumor smooth, with obscure fluctuation. Percussion dull, as high as fifth rib. Slight tenderness in median line and left lumbar region. Urine became scanty, and for three or four days before death there was none voided.

He died June 15, 1869. *Post-Mortem*.—Emaciation extreme. Rigor mortis marked. Intestines adherent to tumor and to each other. Dimensions of tumor after removal: Long circumference, twenty-nine and three-fourths inches; transverse circumference, thirteen inches; weight, ten pounds.

Examination showed it to be a hydatid cyst.



Echinococcus cyst. Right kidney.

Hydatid disease of the kidney is rare, especially in this country. In a comprehensive article on "Echinococcus Disease in North America," by Irving P. Lyon, of Buffalo, published in the January number of the *American Journal of Medical Sciences*, 1902, I find that in 241 cases, to which references are given, the kidney was involved only nine times, or 3.7 per cent. of all cases.

In some of these cases other organs were involved besides the kidney. In case 23, male, aged fifty-three years, the kidney alone was involved; case 34, male, aged forty-five years, the kidney; case 80, male, aged forty-three years, the kidney; case 85, female, aged fifty-two years, multiple cysts in bladder, pelvis, liver, spleen, kidney, omentum, peritoneum, diaphragm, and pericardium; case 108, male, the kidney; case 109, male, the kidney; case 143, male, aged fifty-three years, multiple cysts in lung, omentum, mesentery, subdiaphragmatic, left kidney, sac left inguinal hernia; case 181, male, aged fifty-five years, right kidney.

In the article on Hydatids of the Kidney, in Henry Morris's book on "Surgical Diseases of the Kidney and Ureter," I find a summary of cases of hydatids in all parts of the body reported by Davine, Neissen, Finsen, and Thomas, to the number of 2111. Of these 115, or 5.44 per cent., were located in the kidney, but Morris states that Gardner is inclined to believe that this percentage is much too high.

With reference to sex, Morris's cases were about evenly divided, and Lyon's show 60 per cent. males and 40 per cent. females. The age at which the disease was discovered varies from four to seventy-two years, with the maximum number between twenty and forty years of age.

When the disease is limited to the kidneys, the left is involved twice as often as the right, according to Morris; but in the cases cited by Lyon, which I have been able to trace, the right kidney was involved twice, the left once, both kidneys once.

According to the nationality of cases reported in North America, echinococcus disease is found in only 9 per cent. of

native Americans, the remaining 91 per cent. being distributed among foreign born, chiefly among those from Iceland, Germany, Italy, and England.

Etiology.—*Echinococcus* disease is due to the ingestion of the ova of the *tænia echinococcus*, a very small tapeworm having its habitat in dogs and wolves. By the action of the gastric juice the envelope of the ovum is dissolved and the embryo freed. It is then able to penetrate the coats of the stomach or intestine and be carried to other parts of the body by the blood, lymph, or by migration.

The portal system draining the digestive organs and terminating in the liver explains the frequency of hydatids of the liver—73 per cent. of all cases (Lyon).

Kermisson attributes to contusions a determining factor in locating the growth of the cyst, the contusion being attended with the extravasation of blood containing the eggs of the worm.

Wherever arrested, the ovum begins a slow growth. This is attended with the excitation of connective tissue proliferation about it producing the laminated coat by which the egg is encysted. Its growth is very slow, extending over a period of years.

Pathology.—A hydatid cyst of the kidney may be seated superficially or deeply. The characteristics of this form of growth are a smooth, tense, elastic tumor more or less spherical in shape, growing within or projecting from the kidney and varying in size from a small to a very large mass.

The cyst may be single or a typical large mother cyst enclosing numerous secondary ones. The wall varies in thickness in different places and in different cysts. It is usually tough, fibrous tissue, and shows a characteristic lamination. The kidney substance suffers from pressure and undergoes atrophy. This may be extreme, as in the specimen I present, in which all renal tissue had disappeared.

The inner wall of the cyst may be smooth or nodulated by the presence of daughter cysts, or it may be shrivelled up, or undergo calcareous or cartilaginous degenerations.

The cyst usually contains a clear fluid with a specific gravity of from 1004 to 1015. In infected cysts the contents may be pus. In some few cases the fluid has been absorbed, leaving a putty-like *débris*. In the fluid are found the scolices and hooklets upon which an absolute diagnosis rests, daughter cysts, free or attached, with crystals of various salts.

Hydatid cysts are apt to be united to adjacent structures by firm adhesions. The natural course for a hydatid cyst of the kidney is to rupture into the pelvis of the kidney, the intestine, stomach, pleura, or lung. In over two-thirds of cysts of the kidney rupture occurs into the pelvis and the cysts are discharged per urethram. There is no case on record, Roberts says, where a renal hydatid tumor has ruptured spontaneously through the flank.

Symptomatology.—There may be no symptoms where the cyst is small and rupture has not taken place, and the condition discovered only accidentally at an abdominal operation, as in my case or at the autopsy.

In other cases the symptoms are due to the size of the tumor alone or to peritonitis, if the cyst ruptures into the peritoneal cavity. If discharge takes place through the urinary tract, symptoms simulating a renal colic may be present and the daughter cysts found in the urine.

If rupture occurs into the alimentary tract, the cysts may be found mixed with the faeces. After rupture into the lung the cysts have been coughed up. The cysts may be discharged whole if small, or ruptured if large, and the scolices, hooklets, and salts found in the cyst wall.

Urine.—In this connection it should be borne in mind that hydatid cysts and *débris* have been found in the urine that came from cysts not located in the kidney, but which, being adjacent to the urinary organs, ruptured into the pelvis of the kidney—very rare—or into the bladder itself—more common. The urine is usually normal, except at the time the cyst is discharging.

The local symptoms are wanting, or may be merely a

feeling of uneasiness and weight with various grades of tenderness on pressure.

There are no constitutional symptoms unless the cyst becomes infected, and those which then ensue are due not to the cyst itself, but to the process of suppuration. Rupture of a cyst may occur spontaneously or be due to an injury. Permanent cure may follow the first discharge or escape of cysts occur at irregular intervals for many years.

Complications.—These are due to the size of the growth, rupture, or suppuration of the cyst. Rupture into the peritoneal cavity or the lung is rapidly fatal, as the fluid is very toxic. Suppuration does not occur unless the cyst ruptures or has been infected by exploratory puncture, and death will follow from septicæmia unless free drainage is provided.

Diagnosis.—This is impossible in many cases, uncertain in others, and only sure in those that rupture into the pelvis of the kidney and discharge the characteristic vesicles, scolices, or hooklets per urethram.

Among twenty-eight cases, reported by Boeckel and Houzel, submitted to operation for renal hydatids, errors in diagnosis were made in thirteen cases, uncertainty recorded in four, and a correct opinion formed in only eleven (Morris).

As the treatment depends upon the diagnosis, the following features emphasized by Morris are to be kept in mind:

The residence and association of the patient with dogs.

The insidious growth of a tumor with a smooth globular outline, with possibly fluctuation and hydatid fremitus.

The absence of pain, fever, or any change in the urine.

The situation of the tumor in the renal region with possibly a discharge of hydatids in the urine, faeces, or sputum. Following such a discharge there may be diminution in the size of the tumor.

Prognosis.—If the cyst is not interfered with, it usually results fatally from rupture, suppuration, or pressure effects on adjacent organs. A spontaneous cure has sometimes

resulted from withering or rupture. Years may be necessary for either termination.

The perils of a natural ending are so great that early surgical interference is justified in all probable cases. Roberts reports sixty-three cases, in which twenty recovered, nineteen were fatal, and the remainder unknown.

Treatment.—This can be briefly stated to be incision into the tumor and drainage. Nephrectomy has been very fatal, eight cases with seven deaths. (Morris.) Inasmuch as whatever remains of the renal tissue, not involved directly in the hydatid cyst, is able to perform its proper function, excision of the whole kidney is not justifiable, unless the entire organ is destroyed.

Incision into the kidney in sixteen cases gave sixteen recoveries. (*Ibid.*)

The lumbar incision is to be preferred, as then there is small danger of infecting the peritoneal cavity. After the cyst is exposed, its contents should be aspirated, the cyst wall drawn into the wound and fixed there, the wall incised, the cavity curetted, washed out, and drained freely by tube and gauze. Frequent dressings and irrigations will be followed by a gradual shrinkage of the cyst, the growth of granulation tissue, and finally its firm cicatrization.

In a few cases where the cyst is situated superficially it may be excised, the renal wound sutured, and the incision closed over a small drain.

[*Note.*—With the exception of the cases here reported, whatever information is given has been freely taken from Morris, Lyon, and the references furnished by them.]